Review Article

Variability of clinical practice in nursing: an integrative review

Variabilidade da prática clínica em enfermagem, uma revisão integrativa

Variabilidad de la práctica clínica en enfermería, una revisión integradora

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ABSTRACT

Objective: The objective of this literature review was to examine what has been published about variability in clinical practice from the focus of nursing. Methods: We performed a literature search in the principal international databases, selecting those most relevant works. Results: The results were clustered into five groups: studies about variations with respect to guidelines and protocols; studies that analyze nursing practice and that of other health professionals; variations in procedures and nursing care; variations in practice between nurses and physicians; and studies that related variability with characteristics of professionals, units or healthcare centers. Conclusion: The majority of papers found were limited to showing the existence of variability, but few sought variables that predicted it. Future investigations should focus on finding predictors of variability to address unjustified variations that are detected.

Keywords: Physician's practice patterns; Nursing; Review literature as topic

RESUMO

Objetivo: O objetivo desta revisão foi examinar o que foi publicado sobre a variabilidade na prática clínica com base no foco de enfermagem. **Métodos:** Pesquisa bibliográfica realizada nas principais bases internacionais, seleccionando as obras mais relevantes. **Resultados:** Os resultados foram agrupados em cinco grupos: estudo sobre as variações com relação às diretrizes e protocolo, estudos que analisam a prática da enfermagem e de outros profissionais de saúde; variações nos procedimentos e cuidados de enfermagem; variações na prática, entre enfermeiros e médicos e estudos de variabilidade relacionada com características de profissionais, unidades ou centros de saúde. **Conclusão:** A maioria dos artigos encontrados limitou-se a relatar a existência de variabilidade, mas algunas variáveis que buscou, previam. Futuras investigações devem concentrar-se no encontro de preditores de variabilidade para enfrentar variáveis injustificadas que são detectadas.

Descritores: Condutas na prática dos médicos; Enfermagem; Literatura de revisão como assunto

RESUMEN

Objetivo: El objetivo de esta revisión de la literatura es examinar qué se ha publicado sobre variabilidad de la práctica clínica desde el enfoque de la enfermería. **Métodos:** Se realizó una búsqueda bibliográfica en las principales bases de datos internacionales seleccionando aquellos trabajos más relevantes. **Resultados:** Los resultados se han agrupado en 5 grupos: estudios sobre variaciones respecto a guías y protocolos, estudios que analizan práctica enfermera y de otros profesionales sanitarios, variaciones en procedimientos y cuidados de enfermería, variaciones en la práctica entre enfermeras y médicos y estudios que relacionan la variabilidad con características de profesionales, unidades o centros sanitarios. **Conclusión:** La mayoría de los trabajos encontrados se han limitado a mostrar la existencia de variabilidad pero pocos han buscado variables que predigan ésta. Futuras investigaciones deberían centrarse en la búsqueda de variables predictivas de la variabilidad para hacer frente a las variaciones injustificadas que se detecten.

Descriptores: Pautas en la práctica de los médicos; Enfermería; Literatura de revisión como asunto

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INTRODUCTION

Evidence-based medicine (EBM) made its appearance in the eighties and can be defined as the conscious, explicit and judicious use of the best scientific evidence available to make clinical decisions about patient care by integrating individual clinical expertise with the best available external clinical evidence from systematic research and with the consideration of patient preferences [1]. This approach pursues a clinical practice based on evidence generated by research [2]. EBM came about, among other things, as an attempt to standardize clinical practice. The existence of evidence and its diffusion and implementation should, in principle, reduce variability in clinical practice. Although there are earlier precedents [3], it was in the early 1980s when variations in clinical practice (VCP) started to be intensively studied [4,5], with studies on variations in the rates of different surgical procedures between neighboring geographic areas. The phenomenon of variations can be observed from the perspective of different groupings. At a population level, systematic variations in the cumulative incidence of a particular clinical procedure or hospital admission compared to the total population of the area can be observed. These rates allow different areas to be compared and to assess whether there is a different use of services, which could have implications for the costs and outcomes of health care. These studies tend to be carried out between neighboring geographic areas with very similar populations and environmental conditions. In these cases, it would be neither the patients' characteristics nor the environment that would explain the variability.

On an individual level, we can evaluate changes in the care provided to patients in similar clinical situations. Such evaluation not only provides information about the effectiveness or efficiency of technologies, facilities or health professionals but also about how the characteristics of patients (gender, ethnicity, socioeconomic status), health professionals (specialty, age, sex, education, experience, pay), the hospital (size, public or private, rural or urban, university or otherwise) or the healthcare system (financing, organization, coverage) affect variability [6,7]. Most articles on variability have focused on the medical discipline, while far fewer studies have been published in the field of nursing.

The aim of this paper is to review the literature, i.e., the original articles, related to the variability of clinical practice in the area of nursing.

METHODS

In this study, an integrative descriptive review of the original papers related to the variability of clinical practice in the area of nursing was performed.

The study included original papers, published from January 2000 to August 2010, in which determining the variability of clinical practice or describing current nursing practice were among the objectives. Articles specifically dealing with midwives and articles whose objective was to explore attitudes and beliefs about nursing practices or care were excluded from the study. The articles were not excluded on the basis of their methodological quality.

In January 2011, a literature search was performed using the PubMed international databases (digital files on the biomedical and health sciences of the "U.S. National Institutes of Health"), CINAHL (Cumulative Index to Nursing and Allied Health Literature), Cochrane Library, ISI web of Knowledge (Science Citation Index and Social Science Citation Index) and LILACS (Latin American and Caribbean Health Sciences Literature, BVS), limiting the search to between January 2000 and August 2010. The largest descriptor in the Medical Subject Headings (MeSH) of PubMed, on clinical practice variability, in English, was "physician's practice patterns." According to the DeCS database (http://decs.bvs.br/E/homepagee.htm), in Spanish, it was "pautas en la práctica de los médicos" and in Portuguese, "condutas na Prática dos Médicos". In CINAHL, the descriptor was, in English, "practice patterns". In addition to performing the search according to these terms, the minor MeSH descriptors "clinical practice variation" and "nursing" were used. The searches were conducted using descriptors and also considering these terms as words that might appear in the title or the abstract.

To group the articles thematically, a content analysis was performed [8] considering the aim of the study, the selected population and sample, the methodology used and the main results.

RESULTS

A total of 489 articles were found in the different databases. Of these, 18 were repeated, 413 were excluded after reading their abstracts and 20 after reading the full text. Finally, 38 articles were included in the study.

The progressive reading of the articles, according to inductive categories, allowed us to group them into five major categories: 1) studies on variations in clinical practice regarding guidelines and protocols; 2) studies analyzing variations in the clinical practice of nursing and of other health professions; 3) changes in nursing procedures and care; 4) variations in clinical practice between nurses and physicians; and 5) studies linking variability with professional, unit or health center characteristics. The results from the first four categories are shown in the tables, while the results from the fifth category are

Table 1 – Articles included in this study

Author/year	Title	Journal
Jones KR. et al. 2007.	Evidence-based management of chronic wounds.	Adv Skin Wound Care.
Ruchala PL, et al. 2002.	Current practice in oxytocin dilution and fluid administration for induction of labor.	J Obstet Gynecol Neonatal Nurs.
Head K, et al. 2007.	A survey of dysphagia screening practices across England and Wales.	Int J Ther Rehabil.
Barlow SE, et al. 2002.	Medical evaluation of overweight children and adolescents: reports from pediatricians, pediatric nurse practitioners, and registered dietitians.	Pediatrics.
Connelly CD, et al. 2007.	Pediatric health care providers' self-reported practices in recognizing and treating maternal depression.	Pediatr Nurs.
Cowan L, et al. 2003.	Alcohol and drug treatment for women: clinicians' beliefs and practice	Int J Ment.Health .Nurs
Cowley S, et al. 2007.	What do health visitors do? A national survey of activities and service organisation	Public Health.
Douglas F, et al. 2006	Primary care staff's views and experiences related to routinely advising patients about physical activity. A questionnaire survey.	BMC Public Health
Hanrahan NP, et al. 2005.	Practice Patterns and Potential Solutions to the Shortage of Providers of Older Adult Mental Health Services	Policy Polit Nurs Pract
Seymour S, et al. 2000.	Preoperative fluid restrictions: hospital policy and clinical practice	Br J Nurs
Todd M, et al. 2008.	Survey of Doppler use in lymphoedema practitioners in the UK	Br J Community Nurs
Giramonti KM, et al. 2008.	Variations in practice patterns regarding constipation in children with urinary tract infections.	Urol Nurs
Glod CA, et al. 2000.	Prescribing patterns of advanced practice nurses: contrasting psychiatric mental health CNS and NP practice.	Clin Excell. Nurse Pract
Madden E, et al. 2007.	Emergency nurses' current practices and understanding of family presence during CPR.	J Emerg Nurs.
McCarthy AM, et al. 2000.	Medication administration practices of school nurses.	J Sch Health.
O'Brien SH 2008.	Variation in DVT prophylaxis for adolescent trauma patients: a survey of the Society of Trauma Nurses.	J Trauma Nurs.
Reeve K, et al.2004.	Health promotion attitudes and practices of Texas nurse practitioners.	J Am Acad Nurse Pract.
Rolley JX, et al.2010.	Nursing care practices following a percutaneous coronary intervention: Results of a survey of Australian and New Zealand cardiovascular nurses.	J Cardiovasc Nurs.
Tompkins TH, et al. 2009.	Nurse practitioner practice patterns for exercise counselling	J Am Acad Nurse Pract.
Ashton J, et al. 2006.	Survey comparing clinicians' wound healing knowledge and practice.	Br J Nurs.
Badger MJ, et al. 2002.	Nurse practitioners' treatment of febrile infants in Utah: comparison to physician practice nationally.	J Am Acad Nurse Pract.
Cipher DJ, et al.2006.	Prescribing trends by nurse practitioners and physician assistants in the United States.	J Am Acad Nurse Pract.
Davis K, et al. 2007.	Evaluating nurse prescribing behaviour using constipation as a case study.	Int J Nurs Pract
Fisher SE, et al. 2003.	Similarities and differences in clients treated and in medications prescribed by APRNs and psychiatrists in a CMHC	Arch Psychiatr Nurs.
Harrison,S et al. 2002.	An investigation of professional advice advocating therapeutic sun exposure	Aust.N.Z.J Public Health
Lobo ML, et al.2004.	Current beliefs and management strategies for treating infant colic.	J Pediatr Health Care.
Running A, et al. 2006.	Prescriptive patterns of nurse practitioners and physicians	J Am Acad Nurse Pract.
Sidani S, et al. 2006.	Processes of care: comparison between nurse practitioners and physician residents in acute care	Nurs Leadersh (Tor. Ont.)
Birnbaum R, et al. 2009.	Nonoral feeding practices for infants in the neonatal intensive care unit.	Adv Neonatal Care.
Brunker C. 2006.	Assessment of sedated head-injured patients using the Glasgow Coma Scale: an audit.	Br J Neurosci Nurs.
Mayo AM, et al. 2010.	Clinical nurse specialist practice patterns.	Clin Nurse Spec.
Courtenay M, et al. 2007.	Independent extended nurse prescribing for patients with skin conditions: a national questionnaire survey.	J Clin Nurs.
Carey N, et al. 2007.	Supplementary nurse prescribing for patients with skin conditions: a national questionnaire survey.	J Clin Nurs.
Ruchala PL, et al. 2002.	Current practice in oxytocin dilution and fluid administration for induction of labor.	J Obstet Gynecol Neonatal Nurs.
Van Eijk MM, et al. 2008.	Intensive care delirium monitoring and standardised treatment: a complete survey of Dutch Intensive Care Units.	Intensive Crit Care Nurs.
Burns KJ, et al. 2000.	Prescription of physical activity by adult nurse practitioners: a national survey.	Nurs Outlook.
Minnick AF, et al. 2007.	Resource clusters and variation in physical restraint use.	J Nurs Scholarsh.
Minnick AF, et al. 2007.	Prevalence and variation of physical restraint use in acute care settings in the US.	J Nurs Scholarsh.

laid out in the text. Table 2 shows the three articles whose objective, in addition to showing the current clinical practice of nurses, is to determine the concordance of clinical practice with available guidelines, protocols or evidence. These studies show, for example, variability in wound healing and medication administration.

The variations in the clinical practice of nursing professionals have been occasionally observed together with the variations in clinical practice of other health professionals. The eight papers shown in Table 3 are intended to describe the clinical practice for specific patient groups among the different professionals who care for them.

Table 4 shows eight studies that describe changes in various nursing procedures and care. Among them are papers describing variations in the prescribing patterns or administration of medications, in health promoting activities or in the specific care practices of intensive care units.

The nine articles in Table 5 examine the variations between nurses and physicians in various activities with the aim of comparing the clinical practice among these professionals. These articles address variations in areas including the prescribing patterns, the care provided and health promotion.

Table 2 – Articles showing the variations in clinical practice regarding guidelines and protocols

Author/year/journal	Title	Final sample	Method	Analysis unit	Observed variations
Jones KR. et al. 2007. Adv Skin Care.	Evidence-based management of chronic wounds.	400	Record review	Centers	Concordance with evidence, guidelines and protocols in chronic wound healing.
Ruchala PL, et al. 2002. J Obstet Gynecol Neonatal Nurs.	Current practice in oxytocin dilution and fluid administration for induction of labor.	256	Survey	Units	Types of oxytocin dilution fluids and agreement with guidelines.
Head K, et al. 2007. Int J Ther Rehabil.	A survey of dysphagia screening practices across England and Wales.	60	Survey	Units	Use of evidence in dysphagia screening.

Table 3 – Articles in which nursing clinical practice is analyzed together with other health professions

Author/year/journal	Title	Final sample	Method	Unit of Analysis	Observed variations
Barlow SE, et al. 2002. Pediatrics.	Medical evaluation of overweight children and adolescents: reports from pediatricians, pediatric nurse practitioners, and registered dietitians.	940	Survey	Professionals	Evaluation of obesity.
Connelly CD, et al. 2007. Pediatr Nurs.	Pediatric health care providers' self-reported practices in recognizing and treating maternal depression.	96	Survey	Professionals	Recognition and action on maternal depression.
Cowan L, et al. 2003. Int J Ment.Health .Nurs	Alcohol and drug treatment for women: clinicians' beliefs and practice	217	Survey	Professionals	Treatment of alcoholic women.
Cowley S, et al. 2007. Public Health.	What do health visitors do? A national survey of activities and service organization	1459	Survey	Professionals	Home care.
Douglas F, et al. 2006 BMC Public Health	Primary care staff's views and experiences related to routinely advising patients about physical activity. A questionnaire survey.	757	Survey	Professionals	Advising about physical activity.
Hanrahan NP, et al. 2005. Policy Polit Nurs Pract	Practice Patterns and Potential Solutions to the Shortage of Providers of Older Adult Mental Health Services	700.000	Database review.	Professionals	Number and characteristics of patients seen.
Seymour S, et al. 2000. Br J Nurs	Preoperative fluid restrictions: hospital policy and clinical practice	90	Interview and historical review.	Professionals	Preoperative fluid restriction protocol.
Todd M , et al. 2008. Br J Community Nurs	Survey of Doppler use in lymphoedema practitioners in the UK	250	Survey	Professionals	Lymphedema evaluation.

Table 4 – Articles studying the variations produced during nursing procedures and cares

Author/year/journal	Title	Final sample	Method	Unit of Analysis	Observed variations
Giramonti KM, et al. 2008. Urol Nurs	Variations in practice patterns regarding constipation in children with urinary tract infections.	37	Survey	Professionals	Diagnosis and treatment of constipation in children.
Glod CA, et al. 2000. Clin Excell.Nurse Pract	Prescribing patterns of advanced practice nurses: contrasting psychiatric mental health CNS and NP practice.	1352	Survey	Professionals	Prescribing patterns.
Madden E, et al. 2007. J Emerg Nurs.	Emergency nurses' current practices and understanding of family presence during CPR.	90	Survey	Professionals	Family presence during cardiopulmonary resuscitation.
McCarthy AM, et al. 2000. J Sch Health.	Medication administration practices of school nurses.	649	Survey	Professionals	Medication administration.
O'Brien SH 2008. J Trauma Nurs.	Variation in DVT prophylaxis for adolescent trauma patients: a survey of the Society of Trauma Nurses.	163	Survey	Centers	Deep vein thrombosis prophylaxis
Reeve K ,et al.2004. J Am Acad Nurse Pract.	Health promotion attitudes and practices of Texas nurse practitioners.	442	Survey	Professionals	Health promotion.
Rolley JX, et al.2010. J Cardiovasc Nurs.	Nursing care practices following a percutaneous coronary intervention: Results of a survey of Australian and New Zealand cardiovascular nurses.	110	Survey	Professionals	Care practices following coronary intervention
Tompkins TH, et al. 2009. J Am Acad Nurse Pract.	Nurse practitioner practice patterns for exercise counselling	398	Survey	Professionals	Health education.

Table 5 – Articles comparing the clinical practice between nurses and physicians

Author/year/journal	Title	Final sample	Method	Unit of Analysis	Observed variations
Ashton J, et al. 2006. Br J Nurs.	Survey comparing clinicians' wound healing knowledge and practice.	74	Survey	Professionals	Wound healing.
Badger MJ, et al. 2002. J Am Acad Nurse Pract.	Nurse practitioners' treatment of febrile infants in Utah: comparison to physician practice nationally.	72	Survey	Professionals	Knowledge of guidelines.
Cipher DJ, et al.2006. J Am Acad Nurse Pract.	Prescribing trends by nurse practitioners and physician assistants in the United States.	88346	Database review	Professionals	Prescribing patterns.
Davis K, et al. 2007. Int J Nurs Pract	Evaluating nurse prescribing behaviour using constipation as a case study.	6241	Database review	Professionals	Prescribing patterns.
Fisher SE, et al. 2003. Arch Psychiatr Nurs.	Similarities and differences in clients treated and in medications prescribed by APRNs and psychiatrists in a CMHC	5500	Record review	Professionals	Prescribing patterns.
Harrison,S et al. 2002. Aust.N.Z.J Public Health	An investigation of professional advice advocating therapeutic sun exposure	415	Survey	Professionals	Health education.
Lobo ML, et al.2004. J Pediatr Health Care.	Current beliefs and management strategies for treating infant colic.	431	Survey	Professionals	Treatment of infant colic.
Running A, et al. 2006. J Am Acad Nurse Pract.	Prescriptive patterns of nurse practitioners and physicians	400	Record review	Professionals	Prescribing patterns.
Sidani S, et al. 2006. Nurs Leadersh (Tor. Ont.)	Processes of care: comparison between nurse practitioners and physician residents in acute care	41	Survey	Professionals	Care and coordination of services.

As for the results of the fifth group, we found ten articles linking variability with the characteristics of professionals, patients or units and centers, and also articles searching for predictor variables of variability. Variability was observed in 28 neonatal intensive care units (ICU) regarding the selection of the type of feeding tube, which depended on whether the ICU was located in pediatric institutions [9]. Variations were observed in 23 ICUs regarding the neurological assessment of sedated patients, with differences depending on whether the units treated exclusively neurological patients [10]. Another study found variations in the activities of nurses by specialty, years of experience and size of the organization. [11] Differences were observed in the prescription and types of prescribed diseases according to educational level, place of work and years of experience. [12,13]

One study found no significant differences among the 256 units surveyed regarding the fluids in which oxytocin was diluted to induce labor [14]. A low use of rating scales and a lack of protocols were observed for the treatment of delirium in intensive care units. It was also found that this variability was not explained by the type of hospital. [15] In another study, after surveying 743 nurses on the type of gloves used during wound healing, differences were observed according to whether they worked in acute care centers or in home care.

Variations have been found in the physical activity advice provided by 606 nurses. Providing advice was related to their acknowledging they had sufficient knowledge to do so, their postgraduate training and their exercising [16]. One author found variability in the rates of physical restraints within and among 40 acute hospitals. Resources did not explain the variability, but patient and unit characteristics were related to variations in the rate of physical restraints, which was higher in male patients, in patients with mechanical ventilation and in patients admitted to the ICU [17-18].

DISCUSSION

Most of the reviewed studies were conducted in Anglo-Saxon countries and focused on the variability of clinical practice in the care of adult patients.

The studies are very heterogeneous in terms of procedure and study population; there are different techniques of data collection and analysis, making it difficult to standardize the results of this study. In the reviewed articles, variability has been observed from the perspective of different groupings. Variability has been mainly observed at an individual level and among different professional groups, but it has also been observed among units, centers and even countries.

The methodology used for data collection has been mainly questionnaire surveys. Questionnaires were sent mostly by mail but also via the Internet. Telephone surveys and other methods such as the direct observation and review of medical records were also used.

The studies on the variability in clinical practice began with the medical approach. The production of studies on the variability in medical practice is far greater than the number of studies on the variability in clinical practice from the point of view of other healthcare professionals [20]. According to our review, few studies have focused on the variations in clinical practice in the nursing discipline. These articles are indexed in the databases with the descriptor "clinical practice variation", but it seems that many other articles related to this topic are indexed under other less specific descriptors of variability in clinical practice, such as "Questionnaires" or "Health Knowledge", "Attitudes" and "Practice". This indexing has made it difficult to perform a specific bibliographic search. Furthermore, from a population standpoint, there is a lack of population databases containing relevant clinical data, such as functional status or quality of life, to be used in the study of variation. This lack makes it difficult to obtain nursing practice rates, as it is difficult to separate the performance of nurses from the performance of other professionals [21,22]. As shown in Table 2, many studies have focused on knowing what nurses do and the concordance with available practice guidelines, protocols or evidence. Such studies are necessary because they serve as a starting point for identifying the areas where there is variability among nurses. Having identified these areas, the next step would be to find out if the variations are justified or unjustified. Justified variations would be ones that occur because of differences in health systems, differences in population characteristics or different patient or professional preferences when more than one option can be scientifically accepted [23,24]. These variations are a reflection, in part, of the patient's freedom of choice and the freedom of practice of health professionals, and their elimination makes no sense. Unjustified variations would be ones appearing when all the above-cited factors have already been controlled and that bring no benefits, are detrimental for the patients and lead to a poor quality of health care [25].

The variables that have been associated in these studies with nursing variability are nurse characteristics (e.g., experience, workplace training, degree of knowledge), unit characteristics (e.g., type of patients seen, level of care), hospital characteristics (e.g., size, university teaching, location, country) and patient char-

acteristics (e.g., severity, dependency degree). These variables are consistent with the factors that have traditionally been associated with the variability of practice in medical studies, such as the population-dependent factors, the health system-dependent factors and the clinician-dependent factors. Population-dependent factors relate to differences in the characteristics of the population and the differences in the prevalence of the studied situation, in the distribution of risk factors, the diagnosis, the severity of the disease, the demographic or socioeconomic structure and the educational characteristics of the population that could explain the variability in their care. The health system-dependent factors relate to the human, technical and financial resources, the funding system, coverage, accessibility, economic incentives to professionals, the educational function of the center, the introduction of new technologies, the organizational deficiencies and the lack of equipment, units or personnel. The clinician-dependent factors refer to demographics, training and the professional characteristics involved in the different types of practice [20].

The most cited explanatory theories of variations, so far coming from the medical approach, are the uncertainty hypothesis [26], the patient practice style hypothesis [27] and the physician enthusiasm hypothesis [28]. These theories give different values to the factors involved in variability, such as population-dependent factors and supply-dependent factors, which include health system factors and clinician-dependent factors [7].

The uncertainty hypothesis has had the greatest impact. It is based on differences in the clinical evaluation of the patient or different beliefs about the value of the procedures, the origin of these differences being the presence of uncertainty (no scientific evidence on the outcomes of alternative procedures in a specific situation exists) or ignorance (scientific evidence on the value of the procedures exists, but the health professional is unaware or despite being aware, decides to employ other guidelines).

Although uncertainty in the field of decision-making by nurses has indeed been studied [29,30], and although the variables associated with nurse variability match the factors associated with medical variability, no studies have been found on explanatory theories of practice variability in nurses, and only one study tries to position the variations in nursing practice within the explanatory theories of variation [31].

CONCLUSIONS

Variations in clinical practice have been poorly studied in nursing. The majority of the articles found were limited to showing the existence of such variability. In contrast, few have sought variables related to it, and studies considering the variability in terms of variables at different levels (e.g., personal, unit, center, region) are practically inexistent. Future research should focus on finding predictors of variability to address the unjustified variations that are detected. The use of a common taxonomy and the standardization of health care through protocols and clinical practice guidelines are emerging as a way to reduce variations in clinical practice.

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